SPECTRAL ENHANCEMENT USING DIGITAL FREQUENCY WARPING

ABSTRACT OF THE DISCLOSURE

A frequency-warped processing system using either sample-by-sample or block processing is provided. Such a system can be used, for example, in a hearing aid to increase the dynamic-range contrast in the speech spectrum, thus improving ease of

5   listening and possibly speech intelligibility. The processing system is comprised of a cascade of all-pass filters that provide the frequency warping. The power spectrum is computed from the warped sequence and then compression gains are computed from the warped power spectrum for the auditory analysis bands. Spectral enhancement gains are also computed in the warped sequence allowing a net compression-plus-enhancement

10   gain function to be produced. The gain versus frequency function is a set of pure real numbers, so the inverse frequency domain transform gives a set of time-domain filter coefficients. The speech segment is convolved with the enhancement filter in the warped time-domain to give the processed output signal. Processing artifacts are reduced since the frequency-warped system has no temporal aliasing.

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